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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/240,275	01/29/1999	HARVEY L. BERGER	12-0892	7177

7590 11/05/2003

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EXAMINER

KIM, KEVIN

ART UNIT	PAPER NUMBER
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2634

16

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

KS

**Office Action Summary**

Application No.

09/240,275

Applicant(s)

BERGER ET AL.

Examiner

Kevin Y Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4,8-10,14 and 18-20 is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7,11-13,15-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-3,5-7,11-13 and 15-17 have been considered but are moot in view of the new ground(s) of rejection. The claims have been amended such that "the actual distance" between said received signals is determined. Applicant asserts that, since in the case of the prior art the radius X (which is a decision boundary) is selected to optimize the probability of discriminating between one innermost symbol and three outmost symbols in a constellation, it is not based on actual distance. However, the computation is to find a midpoint for distinguishing between the inner symbols and the outer symbols. This computation suggests a motivation to find the distance between the innermost symbols and the outmost symbols in the symbol constellation so that the midpoint of the distance could be used as a decision boundary.

### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1,2,5,6,11,12,15,15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barabash et al (US 5,640,417).

Consider claims 1,5,11,15. Barabash et al discloses a demodulator (Fig.5) comprising "a system for receiving modulated signals," (44), "a storage device for storing initial decision boundary" (Fig.7, 69). See also col.9, lines 26-33. Barabash et al teaches "a system for adjusting said initial boundaries." See col.6:66 – col.7: 8. Lastly, Fig.5 shows "a system for

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decoding" (58). Barabash fails to teach "a system for determining the actual distance between said received signals." It proposes selecting a boundary, the radius  $X$ , in such a way to optimize the probability of discriminating between one innermost symbol and three outmost symbols in a constellation. This computation for all practical purposes suggests a motivation to dynamically find a midpoint for distinguishing between the inner symbols and the outer symbols in the symbol constellation, which would involve computing the distance between the innermost symbols and the outmost symbols and using the half distance as the midpoint in a simple approach. Thus, it would have been obvious to one skill in the art at the time the invention was made to compute the distance between the innermost symbols and the outer symbols and select the symbol decision boundary using half the distance as a way of optimize the probability of discriminating between one innermost symbol and three outmost symbols in a constellation.

Regarding claims 2, 6, 12 and 16 calling a system for mapping the adjusted boundary to a decision map, see Fig. 3 of Barabash et al where the adjusted boundary,  $X$ , is mapped to a decision map, i.e., a constellation.

5. Claims 3, 7, 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barabash et al as applied to respective base claims above, and further in view of Sotome et al (US 5,761,216).

Barabash et al discloses all the subject matter claimed except for "a symbol error counter for comparing said decoded signals to a predetermined training sequence to further improve the bit error rate." Sotome et al teaches an error counter that counts errors by comparing a signal to be measured with a reference pattern for the purpose of measuring bit error. See Fig. 18A.

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Thus, it would have been obvious to one skilled in the art at the time the invention was made to add an error counter such as taught by Sotome et al to the decoder stage of Barabash et al for the purpose of measuring bit error, which is a critical communication characteristics when bit error rate is to be reduced, thereby improving communication system.

***Allowable Subject Matter***

6. Claims 4,8-10,14,18-20 are allowed.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y Kim whose telephone number is 703-305-4082. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

kvk



**SHUWANG LIU**  
**PRIMARY EXAMINER**